Substitute Motor Fuels

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Because we have a plentiful supply of crude oil in this country we have yet to experience a drastic motor fuel economy. It is a very common sight, more so since the opening of the Nazi offensive, to see an acetylene burning motor car in Italy, a wood burning car cruising down the main streets of Paris, or a methane gas filling station on some German street corner.

These countries, as well as England, have no petroleum resources. Consequently, they were forced to use their only alternative, namely, research. Research was conducted to make use of their own potential motor fuel supplies from coal, vegetables, cereals, wood, natural gas and oil shale.

This research was not done for the sole purpose of producing fuel for motor vehicles such as pleasure cars, trucks, busses, and airplanes, but also to satisfy the desire to become nationally self sufficient. These endeavors were pointed toward utilizing their own resources and keeping their people employed.

To further promote this plan several European nations directly and indirectly subsidized some of the new fuels through taxes on the imported motor fuels, and partially reduced the taxes on their own nationally produced fuels and on vehicles consuming these products. Before the outbreak of the present crisis the tax on all gasoline from the United States shipped into Italy was fifty-one cents per gallon and thirty-six cents per gallon in Germany. Our gasoline arrived at Hamburg with a wholesale price of nine cents per United States gallon.

The most common substitute in Europe today comes from the hydrogenation of coal and carbon monoxide. This synthetic fuel production in Germany is at the rate of 17,000,000 barrels a year. Units now operating, or under design and construction, furnish this amount by two processes. In England the rate of direct coal hydrogenation to gasoline is about 1,300,000 barrels a year. France, on the other hand, was operating a 110,000 barrel-a-year catalytic unit to convert water gas to motor fuel. For European conditions the various sources indicate that the cost per United States gallon of motor fuel produced by either coal or carbon monoxide hydrogenation is about eighteen cents.

The combustible gases used for motor fuel such as coal gas, methane, ethane, propane, and butane are stored under pressure in light weight alloy cylinders attached to the motor vehicle, or if larger tanks are used, trailers are drawn, carrying the tanks. The costs for converting motor vehicles into the compressed gas type ranges from $150 to $300, depending upon the size. The tanks weigh about 115 pounds empty; when filled with propane-butanes at a pressure of 150 pounds per square inch, one tank weighs 215 pounds. Thus, a net of 100 pounds of compressed gas is equivalent to eighteen gallons of gasoline. The principle operation in this converted type of automobile is the control of the pressure reduction by means of a regulating valve, so that a steady flow of gas passes to the motor. In place of the normally used gasoline carburetor a special gas-air mixer is employed to give proportionate mixes.

Despite the fact that laws have been passed and subsidies granted in favor of gasoline substitute consumption, the number of wood-burning motor vehicles in Europe is relatively small. It has been estimated that twenty-five pounds of wood, costing about sixteen cents, will give the equivalent distance performance of one gallon of gasoline. Off hand, this indeed seems economical and we immediately ask ourselves, "Why aren't there more wood burning vehicles in use?" The equivalent sixteen cents per gallon of gasoline cost is much higher when one takes into consideration the high gasoline tax, absence of taxes on wood, government subsidy in converting vehicles from gasoline to wood burner, and the greater labor, repair and depreciation costs involved in using wood-burning vehicles compared to gasoline. Then too, wood as a power substitute can only be encouraged where the natural resources permit it. Not only is the initial cost of gasogene vehicles, as they are known in Europe, higher than gasoline, but also the bulk and weight of the generator give use to arguments against it. When consideration is given to the inconvenience and delay in starting plus delays due to cleaning and reduced efficiency; wood as a motor fuel is incomparable to gasoline except as necessity demands its use.